ELECTRICITY ON THE FARM *Magazine*

MARCH, 1956

"I Switched To Electric Cooking"
All-Weather Barn Cleaning . . . .
New and Useful Equipment . . . .
Worry-Free Water Heating . . . .
Mechanized Chores Saves Labor

COST OF ELECTRICITY LOST THROUGH SKIMPY WIRING

WIRE SIZE A.W.G.	DIST-ANCE FT.	ELECTRICAL LOAD—AMPERES												
		6	10	15	20	25	30	35	40	50	60	70	80	90
#14	50	$0.10	$0.26	$0.60										
	100	0.19	0.52	1.20										
	200	0.38	1.04	2.40										
	300	0.57	1.06	3.60										
#12	50	0.06	0.16	0.36	$0.64									
	100	0.12	0.32	0.72	1.28									
	200	0.24	0.64	1.44	2.56									
	300	0.36	0.96	2.16	3.84									
#10	50	0.04	0.10	0.22	0.40	0.62	$0.90							
	100	0.08	0.20	0.45	0.80	1.24	1.80							
	200	0.16	0.40	0.90	1.60	2.48	2.70							
	300	0.24	0.60	1.35	2.40	3.72	5.40							
#8	50	0.03	0.06	0.15	0.25	0.40	0.60	0.77	$1.02					
	100	0.05	0.12	0.30	0.50	0.80	1.20	1.54	2.04					
	200	0.09	0.24	0.60	1.00	1.60	2.40	3.08	4.08					
	300	0.14	0.36	0.90	1.50	2.40	3.60	4.62	6.12					
#6	50	0.02	0.04	0.09	0.16	0.25	0.36	0.49	0.64	$1.00				
	100	0.03	0.08	0.18	0.32	0.50	0.72	0.98	1.28	2.00				
	200	0.06	0.16	0.36	0.64	1.00	1.44	1.76	2.56	4.00				
	300	0.09	0.24	0.54	0.96	1.50	2.16	2.64	3.84	6.00				
#4	50	0.01	0.03	0.06	0.08	0.15	0.22	0.32	0.40	0.62	$0.90	$1.22		
	100	0.02	0.05	0.12	0.16	0.30	0.44	0.64	0.80	1.24	1.80	2.44		
	200	0.04	0.10	0.24	0.32	0.60	0.88	1.28	1.60	2.48	3.60	4.88		
	300	0.05	0.15	0.36	0.48	0.90	1.32	1.92	2.40	3.72	5.40	7.32		
#2	50		0.02	0.04	0.06	0.10	0.13	0.18	0.24	0.40	0.60	0.77	$1.00	$1.26
	100	0.01	0.03	0.07	0.12	0.20	0.25	0.36	0.48	0.80	1.20	1.54	2.00	2.52
	200	0.02	0.06	0.14	0.24	0.40	0.50	0.72	0.56	1.60	2.40	3.08	4.00	5.04
	300	0.04	0.10	0.21	0.36	0.60	0.75	1.08	1.44	2.40	3.60	4.62	6.00	7.56

BEYOND THE ALLOWABLE CURRENT CARRYING CAPACITY OF INSULATED WIRE

TABLE IS BASED ON 500 HOURS USE OF LOAD; ELECTRICITY AT 2¢ PER KWHr.

OUR 29th YEAR—THIS ISSUE 765,000 COPIES

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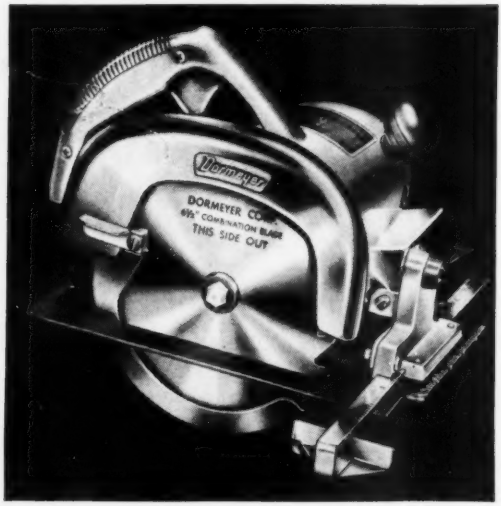

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Editor's Chat

IN THE MUD AND SCUM OF THINGS

"In the mud and scum of things, someone always, always sings." That I remember from "Mrs. Wiggs of the Cabbage Patch." This is "mud and scum" time of year over a good part of this fair land of ours. But one man who sings is the fellow with a good farm shop who likes to put otherwise wasted time to good use. Of course, he sometimes shouts with joy when his shop and equipment make possible a prompt repair when the weather is fine and some job is half done. And a trip to town and perhaps a long wait would mean a costly delay. But in general, the big satisfaction from a cozy, well-equipped shop comes when the weather is disagreeable outside and other work is not practical even though it may be pressing.

Electrified shop tools and adequate light and heat contribute to make a farm shop a good place to be and work just as this mechanized, electrified age make repairs more and more of a problem. So, our "Thought for the day" during the season of frost, mud and rain is to have a good shop where you can keep out of the "Mud and Scum" and do your singing in comfort.

DOUBLE JEOPARDY

Next to weather, perhaps, safety should be of more interest to the farmer than almost anything else. There are two very good reasons for this. Next to accidents on the highways involving automobiles, farmers have more accidents than any other group of our citizens. Inasmuch as most farmers do a lot of driving, they are subjected to what the courts term "double jeopardy."

Apart from the fact that a large percentage of our readers are farmers like you, we just don't like accidents to happen to anyone. They cost everybody suffering and money losses that cannot be estimated. Nobody wins.

Most accidents are due to lack of care and foresight. These two talents certainly can be and should be developed. And it is our hope that these few words of reminder may lead at least a few of our friends to be careful and may even help keep some from an accident.

CHEEP-CHEAP

The cheep-cheep of baby chicks and turkey poults begins to fill the air about this time of year and Cheap-cheap and cheaper brooding is one of the several items engaging the attention of the poultryman. Whether it is fifty or one hundred chicks for a family flock, or fifty thousand for a commercial flock, such items as cost of installation and operation, saving labor, low mortality and good growth are all factors to be considered.

Probably there is no other single branch of farming that has turned so completely to the use of electricity as poultry raising. From lights to produce more and earlier eggs, heat for water founts, automatic feeders, incubation, brooding, killing, picking and freezing—at every step the power of electricity has taken over. In brooding especially, heat lamps, floor cables and electric hovers offer such a wide range of adaptation to local needs that relatively few chickens reach maturity or the table without having the help of electricity somewhere along the way.

Everyone with a farm or room enough to do it should raise enough poultry for family needs. And those who can should try for a better place in this growing industry. That means all of them should use electricity to the fullest possible extent to make the project a success. There is nothing else that can furnish heat and cold and mechanical power as economically.

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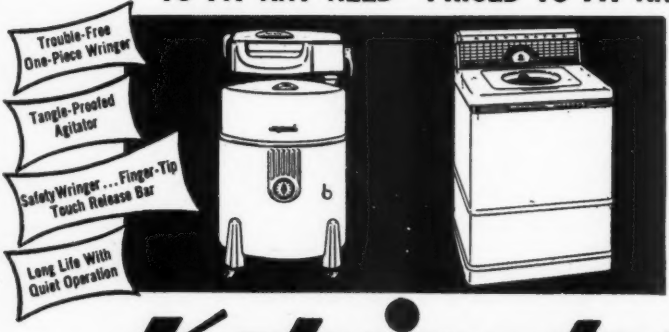
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What Does Skimpy Wiring Cost You?

Chart Shows How Too Much Load on a Circuit Wastes KWHrs

You pay for electric wiring in two ways. First, you pay for it when it is installed. If the wires are large enough, that first cost is practically the whole cost. But if you try to squeeze a lot of electricity through a wire that is too small for the load, you will keep on paying every time electricity flows through those wires. When the wires in a circuit are too small to carry the load connected to it, electricity is wasted in heating the wires. You pay for the electricity used to make this heat in addition to the electricity used to run the motor or appliance.

Table Shows Cost

The table shown on our cover gives the cost of electricity lost in wires that are too small. It is figured for 500 hours time at 2¢ per KWHr. The "distance, ft." is the distance (one way) from the point where the wire you are considering starts to the place where the electrical appliance is used.

For example: A heater requiring 1150 watts plus a 575 watt motor equals 1725 watts on the line. Divide 1725 by 115 volts in the circuit and you have 15 amperes. Your 15 ampere load would operate on a 50 ft. run of No. 14 wire with a loss of 60¢ in 500 hours of operation. If the same load were being carried the same distance on No. 12 wire, the cost would be only 38¢.

Any wire presents some resistance to the flow of electricity. Hence, there is some loss in all wires. The larger the wire and/or the shorter the run, the smaller this loss will be. If electricity is over 2¢ per KWHr, the loss increases accordingly.

Select Most Economical Size

The most economical wiring installation is one where the additional cost of installing a particular size wire over the cost of the next smaller size is equal to or less than the difference of savings in cost of electricty lost between the two wires.

Example: Assume the above mentioned heater and motor load of 15 amperes, the distance of 50 ft., the total usage of 500 hours per year, electricity at 2¢ per KWHr, useful wire life of 10 years, and $2.00 additional cost to install No. 12 wire as compared to No. 14 wire. Using No. 14 wire with the above conditions, the yearly cost for electricity wasted is 60¢ or a total of $6.00 for 10 years. Using No. 12 wire, the yearly cost is 36¢ or a total of $3.60. The saving realized with No. 12 wire is $6.00 minus $3.60 or $2.40. Since No. 12 costs only $2.00 more, it should be used.

The table can also be used to determine the savings realized by adding additional circuits to a present wiring system and dividing load now carried by one circuit. For example: At present, a 200 foot, No. 12 circuit is carrying brooder installations totalling 2300 watts or 20 amperes, the maximum load allowed on No. 12 wire, and more than should be used for this great distance to avoid excessive voltage drops. If this load were divided between two No. 12 circuits, a savings of $2.88 in electricity wasted would be realized for each 500 hours of operation at 3¢ per KWHr.

The brooders would also operate more efficiently since voltage drop is reduced.

Other Handicaps to Avoid

In this presentation, the *cost* of skimpy wiring has been stressed. It should also be noted that in addition to the electricity lost in wires, there are other added handicaps when wire sizes which are too small are used or when too much load is placed on an individual circuit. The improper and inefficient operation of equipment because of the voltage drop or lack of sufficient voltage at the appliance to make it operate properly should also be considered. It is just good business to provide enough circuits with wire sizes capable of carrying the load both properly and economically.

COST OF ELECTRICITY LOST THROUGH SKIMPY WIRING

WIRE SIZE A.W.G.	DISTANCE FT.	ELECTRICAL LOAD—AMPERES												
		6	10	15	20	25	30	35	40	50	60	70	80	90
#14	50	$0.10	$0.25	$0.60										
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	200	0.24	0.64	1.44	2.56									
	300	0.36	0.96	2.16	3.84									
#10	50	0.04	0.10	0.22	0.40	0.62	$0.90							
	100	0.08	0.20	0.45	0.80	1.24	1.80							
	200	0.16	0.40	0.90	1.60	2.48	2.70							
	300	0.24	0.60	1.35	2.40	3.72	5.40							
#8	50	0.03	0.06	0.15	0.25	0.40	0.60	0.77	$1.02					
	100	0.05	0.12	0.30	0.50	0.80	1.20	1.54	2.04					
	200	0.09	0.24	0.60	1.00	1.60	2.40	3.08	4.08					
	300	0.14	0.36	0.90	1.50	2.40	3.60	4.62	6.12					
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	100	0.03	0.08	0.18	0.32	0.50	0.72	0.98	1.28	2.00				
	200	0.06	0.16	0.36	0.64	1.00	1.44	1.96	2.56	4.00				
	300	0.09	0.24	0.54	0.96	1.50	2.16	2.94	3.84	6.00				
#4	50	0.01	0.03	0.06	0.08	0.15	0.22	0.32	0.40	0.62	$0.90	$1.22		
	100	0.02	0.05	0.12	0.16	0.30	0.44	0.64	0.80	1.24	1.80	2.44		
	200	0.04	0.10	0.24	0.32	0.60	0.88	1.28	1.60	2.48	3.60	4.88		
	300	0.06	0.15	0.36	0.48	0.90	1.32	1.92	2.40	3.72	5.40	7.32		
#2	50		0.02	0.04	0.06	0.10	0.13	0.18	0.24	0.40	0.60	0.77	$1.00	$1.26
	100	0.01	0.03	0.07	0.12	0.20	0.25	0.36	0.48	0.80	1.20	1.54	2.00	2.52
	200	0.02	0.06	0.14	0.24	0.40	0.50	0.72	0.96	1.60	2.40	3.08	4.00	5.04
	300	0.04	0.10	0.21	0.36	0.60	0.75	1.08	1.44	2.40	3.60	4.62	6.00	7.56

TABLE IS BASED ON 500 HOURS USE OF LOAD, ELECTRICITY AT 2¢ PER KWHr.

This 3 hp shuttle stroke barn cleaning unit was installed in the Braff barn last fall. It operated satisfactorily in -32°F. weather this winter.

All-Weather Barn Cleaning

Minnesota Sub-Zero Temperatures Create No Operational Hindrances for Mechanical Units

By PAUL A. EDMAN

Recently when a Virgil Braff, who operates a dairy farm near Strandquist, Minnesota, came out to clean his barn with his barn cleaner the thermometer read 32 degrees below zero —would the barn cleaner work? Braff decided to try it. The operation was successful even though some manure stuck to the cold metal parts instantly. The Braff farm is located about 35 miles south of the U.S.-Canadian border. Winter temperatures in this part of Minnesota often stay below zero for weeks at a time so satisfactory sub-zero operation is necessary.

Shuttle Stroke Cleaner

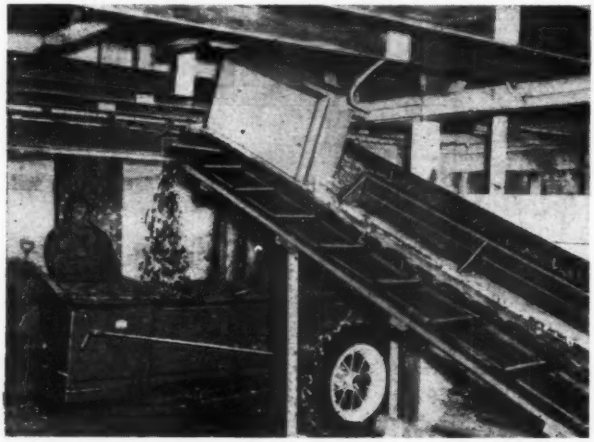
The Braff machine was installed late last fall. A shed to house the spreader, tractor and delivery end of the cleaner was planned but cold weather set in and construction had to be halted. Braff stated, "A shed will insure operation of the tractor, spreader and the cleaner in any weather." The additional space provided by the shed will also be used for bedding storage.

Needless to say, Braff was quite relieved to see the barn cleaner work successfully, even though it is not properly housed. Cleaning for his 18 cows is only a 10 minutes' job for the 3 hp barn cleaner. He estimates that 25 KWHr per month or less than one KWHr a day will be used to operate the machine.

Endless Chain Type Cleaner

Further evidence that barn cleaners will work satisfactorily in very cold climates was found on the Oscar Hanson farm, located near Crookston, Minnesota. Hanson stated, "The other morning the temperature was down to 32 below, but the barn cleaner worked fine. However, the tractor we use to pull the spreader wouldn't start."

The cleaner on the Hanson farm is the chain type, driven by a 3 hp motor. A shed attached to the end of the barn houses the end of the cleaner, also the tractor and spreader. The barn is cleaned in about 10 minutes, saving Hanson and his hired man a back-breaking job.

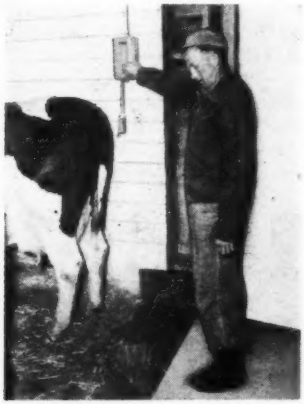


The delivery end of the barn cleaner on the Hanson farm is housed in a shed attached to the end of the barn for protection against weather. The cleaner is an endless chain type driven by a 3 hp electric motor.

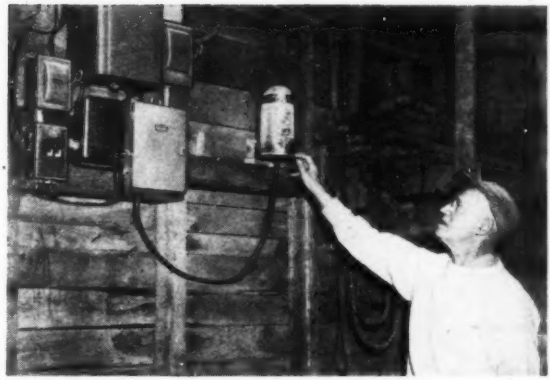
Both Hanson and Braff installed their barn cleaners themselves. The manufacturers provided detailed plans, showing all installation procedures, and they followed these to the letter. As both farms produce grade "A" milk, the cleaners had to be installed in a manner acceptable for the trade.

After seeing these two installations operate so successfully with temperatures at −32° F., there's no doubt about it—barn cleaners will work in any temperature, provided some care is taken in housing the machine!

Hanson, a Crookston, Minnesota dairyman, cleans his barn in 10 minutes, and with less than 1 KWHr per day!



Braff appreciates the push button ease of cleaning his 18-cow dairy barn in 10 minutes. The unit worked satisfactorily in -32°F. weather even though some manure stuck to the cold metal parts instantly.



This "electric eye" control unit, in conjunction with a time clock, guarantees 14 hours of continuous light for poultry. It turns the lights on whenever the illumination in the house falls below 3 foot candles due to cloudiness or darkness.

Poultry Light Control

"Electric Eye" Insures Enough Light to Keep Birds Active 14 Hours a Day

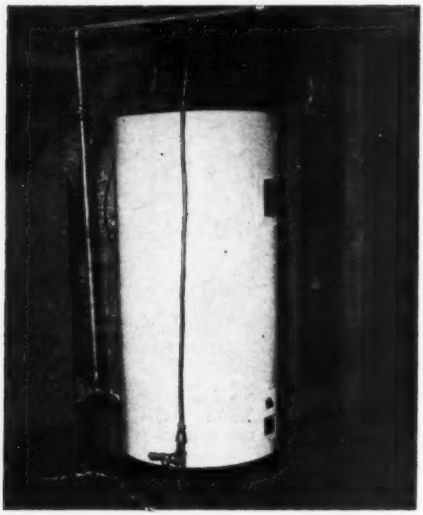
Most poultrymen follow a practice of providing 14 hours of continuous light each day for maximum egg production from their birds. A time clock control will do part of this job by turning lights on in the morning before daylight and then turning them off automatically after sunrise. This arrangement is entirely satisfactory as long as the sun shines all the time between the hours of sunrise and sunset.

On cloudy days, however, the light from outdoors is quite often not enough to provide the recommended 3 foot candles of light in the poultry house necessary to keep birds 'active' so to speak. This can be a very annoying problem on days with scattered clouds—there may be plenty of light at one moment and five minutes later a cloud has covered the sun and indoor illumination is way down.

Frank Lane, poultry farmer from Greenland, N. H., was very disturbed over his poultry lighting situation because of the above mentioned conditions. He wanted to provide the minimum requirement of 3 foot candles of light for his hens during a continuous 14 hour period each day. However, he wanted to do it without leaving his lights on during daylight hours when they were not needed.

The light control shown in the picture solved the problem for him. It is an "electric eye", similar to those used to turn street lights on and off. It will turn the lights on whenever the degree of illumination falls below 3 foot candles. He uses it in conjunction with his time clock control to provide extra hours of lighting for his poultry. The time clock serves as a master switch to turn the lights off 10 hours during each 24 hour period. The "electric eye" switch, in series with the time clock switch, then assures him of having lights as needed during a continuous 14 hour period each day.

J. H. Bodwell



Meiers installed this 82 gal. heater in their basement near the sink. No vent pipe was needed.

Worry-Free Water Heating

Automatic Electric Units Provide Ample Hot Water, When and Where Needed

By KENNETH L. McFATE

You can have plenty of hot water in your home and on your farm for just a few cents a day. You won't have to put up with all the muss and fuss that goes with the chore of lighting and cleaning dangerous burners, either. And, you'll save time, steps and labor, too—with an automatic electric water heater.

Advantages in Electric Units

A study made by Agricultural Engineers of Iowa State College, showed Lorraine Meier, dairy farmer in Clayton County, Iowa, that the actual cost of heating water for home use in Iowa with either oil or electricity was almost the same. However, the many advantages of the automatic electric water heater far outweighed considerations on cost of operation.

The oil heater didn't always keep the water hot at the turn of a faucet as did the electric. Sometimes it was too hot. So for safety reasons the oil burner was lighted only during the day time hours. This amounted to another daily chore on top of the already voluminous routine work that goes with good dairying. After the Meiers' had a fire that destroyed part of their farm home in the early forties, they became more concerned about safety where a flame is involved.

"On washdays", says Mrs. Meier, "I would usually have to fill the oil tank the second time around noon. Then, remembering to shut it off each night was frustrating. Sometimes, when retiring, I'd forget whether I'd done it or not. I'd have to tramp clear down from the upstairs to the basement to check it."

The Meiers have had their electric water heater for many months now and "it's quite a vacation." There is no fuel to carry, no vent pipes to replace periodically, no soot to wipe off the burner, no burner to light, and no odors or flame to worry about. And since no chimney is needed,

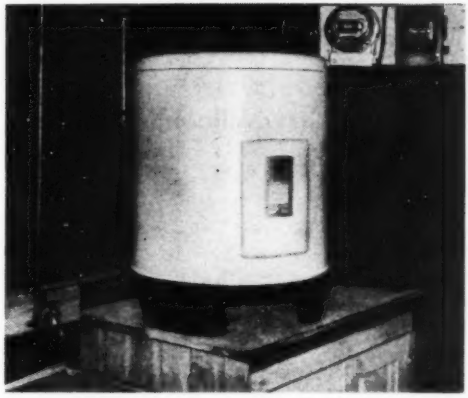
A relatively new type of water heater is the quick recovery unit shown here. This 40 gallon unit has two heating elements. The upper, a 4500 watt unit, will heat the upper 10 gallons of water in the tank to 150°F in about ½ hour. Then the lower 4500 watt unit takes over to heat the remainder of the water in the tank.

electric heaters can be placed closer to the most-used hot water outlets, usually the kitchen sink. The shorter pipe runs save heating costs because less heat is lost in the pipes between uses.

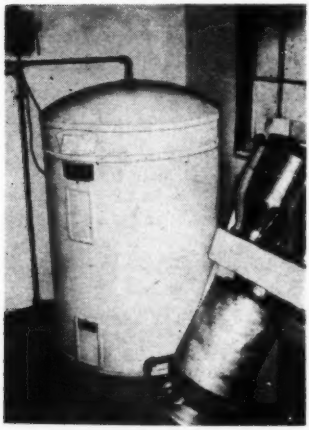
Family Water Uses Vary

The amount of water you use will vary from the amount your neighbor uses. You also use more in summer than in winter because of the dustier field work and dirtier clothes. And, unless your family habits are quite different from the average for household and bathing, you use less than 10 gallons of hot water per person per day. Field research data on storage type electric heaters located in 9 Iowa farm homes shows that the average amount of hot water used was about 7.5 gallons per person per day, with no automatic washers in the study.

When you select an electric water heater you have several choices to make regarding size. The unit you choose will depend upon the size of family, washing practices, and whether you have an automatic washer. In most cases the larger size units are much more desirable. When you buy a large storage type heater (say 80 to 120 gallons), your first cost will be relatively high. Even so, this will be practical and economical in the long run. The larger tank assures you of ample reserve for peak demands.



This 30 gallon electric water heater is used to heat an average of 630 gallons of water per month for cleaning and rinsing purposes in the milkhouse.



Combination water heaters, such as this one on an Iowa farm, are used to heat the milkhouse as well as water for dairy purposes. This type has a channel under the top through which air passes to the front outlet to heat the room.

Milkhouses Need Hot Water

On some dairy farms almost as much, and sometimes more, hot water is used in the milk house and barn as is used in the home. In Black Hawk County, Iowa, on one Grade "A" dairy farm with 17 cows and a U-shaped milking parlor, an average of 630 gallons of hot water per month was required. In their farm home, the four people used about 750 gallons per month.

Electric water heaters of any type automatically heat the water to a specific pre-set temperature. A temperature setting of about 140 degrees F. is usually recommended. This applies to the house as well as the milkhouse.

Whether it be for the home or for the dairy, there is no doubt but that electric water heaters are the logical choice. They provide plenty of hot water, whenever and wherever needed, and the safe, automatic operation affords peace of mind for owner.

Sawdust Catcher for Table Saw

Are you tired of having sawdust all over the floor of your shop? Here is the simple way in which Alan Johnson, Montgomery County, Maryland, took care of this nuisance. He cut a hole in the bench under his saw. Then he nailed some cleats to the underside of the bench at the edge of the hole. Nails were driven part way into these cleats, the heads were cut off, and the ends were sharpened with a file. The nails hold the sack in place under the saw blade.

Practically all of the sawdust is caught in the sack and the floor stays clean and orderly.

Mechanized Choring Saves Labor

Streamlining Farm Practices With Automatic Silo Unloaders Enthuses Dairymen

By L. H. HAMMOND
and
H. A. PRAEGER

The silo unloader, a relatively recent development in electric choring, is getting more and more recognition on the farm these days. Little wonder that it's becoming popular for not only does it eliminate an unpleasant time-wasting chore, but also it performs the work at a cost of only pennies a day.

Once you try a silo unloader, you never want to go back "to digging it out and throwing it down by hand." That's the consensus of a representative group of New York state dairy farmers.

We visited these farmers on a blustery winter day with the mercury no higher than 10° above. Deliberately, we picked different types of installations so that we could see them in action in rough weather. We found that the various farmers had a lot of reasons in common for liking a silo unloader, but each one had a special reason as well. Economic benefit was the principal reason for taking the step, but they all arrived at it by different routes.

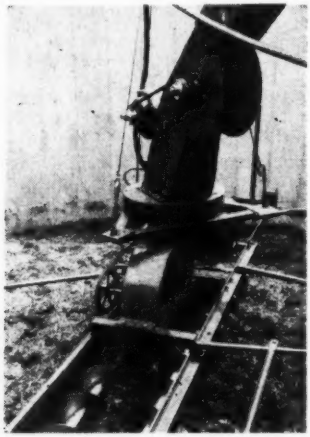
The weather, too, gave the conversation another focus and brought out a thought that is always in the back of a farmer's mind. He knows that getting up in the silo on a bitterly cold day is a good way to encourage those ever-lurking cold germs.

Equipment Reduces Monthly Operating Costs by $185

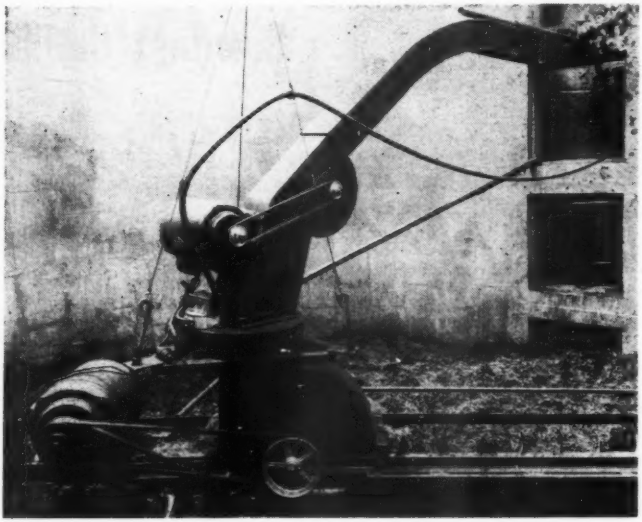
The first farm we visited, Roy Prentice's near Whitney Point, N. Y., affords a good example of how a silo unloader in combination with a barn cleaner can cut operating costs.

Roy Prentice figures that his investment of $2,500 for both the silo unloader and barn cleaner eliminated the need for a hired man. He had been paying out $135 a month for his helper, plus room and board. With room and board figured at around $50, his new equipment actually eliminated $185 a month in operating costs.

In addition to running a farm, Roy Prentice is active in community affairs and is a member of a milk distributor's board.

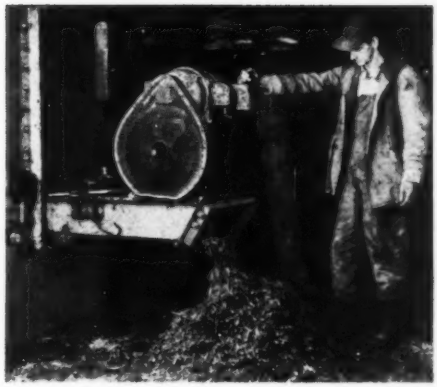


Above: A close-up of the "working end" of the silo unloader. Sharp knives, bolted to the twin augers, cut and chop loose hard packed or frozen silage.



Right: The lower motor drives the augers and the rotary impeller. The impeller throws silage into delivery spout where an auxiliary or booster impeller helps carry material over to silo chute.

Electrical choring with such help as a silo unloader and barn cleaner adds up to extra time for important "off-the-farm" activities.



This silo unloader, being demonstrated here by Ray Hockenberry of Croft Achers farm, is a bottom unloading type. The motor and drive mechanism are mounted outside the silo.

Chore Short Cuts Permit Outside Business Time

Croft Achers near Maine, N. Y., is a large farm for upstate New York with around 1,300 acres in beautiful rolling hill country. The herd is a large one, having 110 milkers.

At Croft Achers the labor force consists of Fred Croft, his son, J. R. Croft, and the farm hand, Ray Hockenberry and his son. Their silo unloader, which takes off from the bottom of the silo and piles up feed for the herd in short order, is a real asset. For on this farm, because of outside business interests, the Crofts have sought to create short cuts for all time-consuming chores.

Silage coming down the chute into a feed cart merely by throwing a switch is a morale builder as well as a labor saver according to Bob Brown shown here.

"J. R.," as the Croft son is known, feels that the automatic silo unloader really does its share of the work on a busy farm. He credits it, in combination with a lot of other mechanical and electrical choring, with giving them time to run a flourishing trailer business known as Croft Trailers. "A silo unloader," says J. R., "is an important help in keeping work on schedule."

Electric Choring Leaves Time For Farm Planning

That the farm is still a family-managed business enterprise in many instances is well demonstrated on the Morris O. Brown farm, near Owego, N. Y. Morris Brown had the courage and stick-to-it-ness to build up a sizeable herd of 52 milkers.

"Yes, we all like our new silo unloader," says Morris Brown. "As a matter of fact, the closer we can get this job of silage feeding to a completely automatic one, the better both the boys and I will like it." The boys, Bob and Walt, and their father take a keen interest in any proposition that will modernize a farm operation. They say that electric choring like the silo unloader gives them a chance to put in time on more important farm plans.

Unloader Handles Frozen Grass Silage

Joseph Kwiatkowski and his sons, who farm 200 acres in Tioga County, New York, agree with their fellow farmers as to labor-saving help one gets from a silo unloader, but they have another interesting and different experience to report.

They bought their unloader subject to its doing a satisfactory job on grass silage. On the Prentice, Croft and Brown farms the silage is corn, but the Kwiatkowskis wanted an unloader that would handle grass satisfactorily. "And one of the things I like best," said Joseph Kwiatkowski, "is the way the unloader breaks up frozen silage and serves it up thoroughly mixed and completely broken up. It does an excellent job. There's no doubt it's geared to fit into grassland farming."

All Farmers Enthused

These New York dairy farmers felt that not only was the automatic unloader the smart way to get things done and to save muscle power, but they also felt that business-minded farmers cannot afford to work at tasks that can be done efficiently for only three to five cents a day in operating costs. One said: "You can figure that your own time for pitching down a ton of silage is worth only about a nickel. It doesn't make any sense to use a hired man that way either."

So, looked at strictly from a dollar and cents point of view, these modern farmers feel that silo unloaders make good economic sense. They also feel that how a person budgets his time on the farm these days is going to go a long way in determining how successful the overall farm operation will be.

Fig. 1. The old metallic sheathed cable was rusted and corroded, ultimately causing short circuits and current losses.

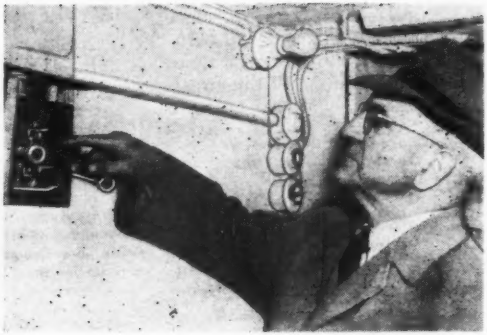


Fig. 2. Original wiring used a 30 amp fuse box and a 150 ft, No. 14 circuit for milker, lights and other loads in the barn.

A Modern Dairy Needs Modern Wiring

System Must Be Geared to Handle Growing Loads

By J. H. BODWELL

Arthur Bartlett of Eliot, Maine, is one of the most progressive dairymen in this area. In 1928, he started a retail milk business instead of selling his milk wholesale as he had previously been doing. He has now brought every part of his operation up to modern standards, from his herd to his milk route trucks. His processing equipment includes a clarifier, pasteurizer, bulk milk cooler, an instantaneous cooling unit for use after pasteurizing, electric ice maker, and other necessary auxiliary pieces of equipment.

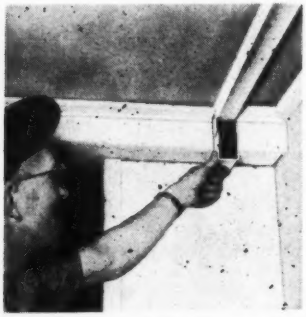


Fig. 3. Here, Bartlett has opened the moisture proof channel to show the different wires for various circuits in his barn.

As far back as 1945, Arthur began to notice that his wiring system, the arteries of his mechanical dairy plant, was not adequate. With his usual progressiveness, he started modernizing that also. Over the years this process continued so now his wiring is big enough for the present and foreseeable future.

However, before we talk about this new wiring system, let us return to his original wiring which caused all the trouble. "I was bothered in many ways" says Bartlett. "Fuses were blowing constantly. Short circuits developed which quite often gave me a 'shot in the arm' as well. Motors were slow to start and always seemed to labor hard and act sluggishly. The lights always dimmed noticeably when the motors were running. Sometimes

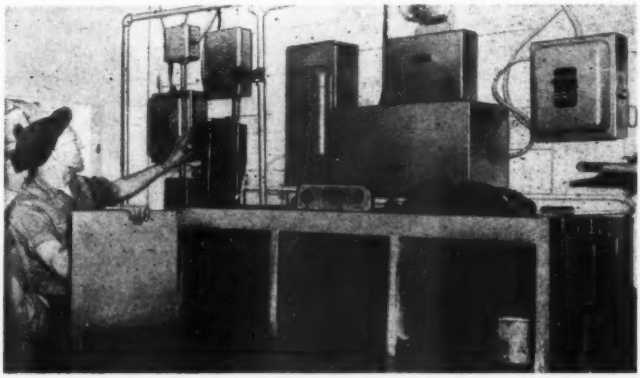


Fig. 4. Bartlett points out his original entrance box which is still in the system. The present entrance panel board, in contrast, has a meter, a metering transformer, a 200 ampere entrance switch, and, on the right, a double throw switch for use with his standby generator, if it is ever needed.

I even had some motors burn out which I attributed to the poor wiring and low voltage conditions."

Figures 1 and 2 show what were the primary causes of the

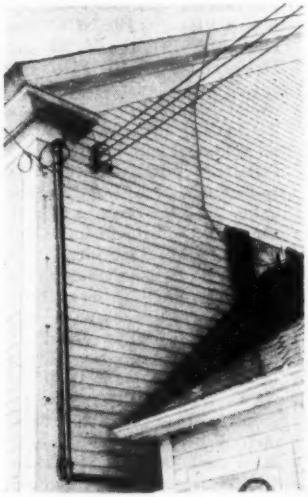


Fig. 5. The barn is now served with three No. 00 entrance cables in the conduit at left. The meter is inside barn and the three wires at right serve the house.

troubles Bartlett was experiencing. He had to overfuse to make his appliances work at all. This created a definite fire hazard besides all the trouble already mentioned.

Adequate Wiring Pays Dividends

Figures 3 through 5 show how Bartlett remedied his skimpy wiring to take care of his increased load of electrical equipment. Since his modernized wiring system has been installed, Bartlett says he could not buy ice to cool his milk for what the monthly electric bill amounts to for his entire farm. This includes his home which is equipped with all the modern appliances that any homemaker could desire.

Needless to say, Bartlett feels that adequate wiring pays big dividends in operational costs. It prevents many costly tie-ups and repair bills that could disrupt the operation of his dairy plant.

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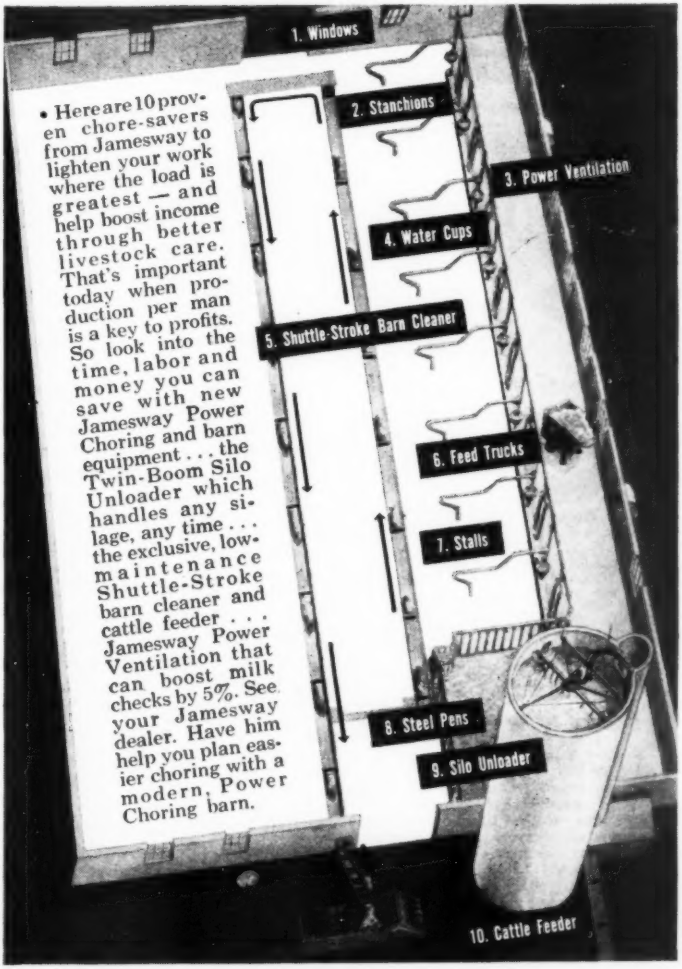
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10. Cattle Feeder
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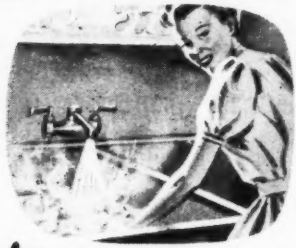
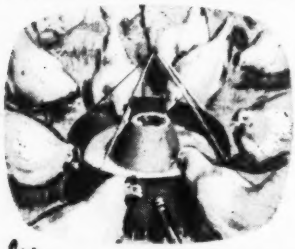
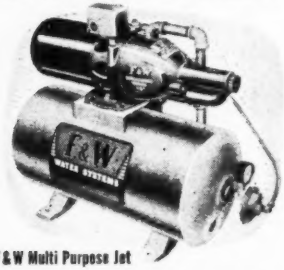


for better health, greater comfort and convenience in your home



for increased production, less work, more profit on the farm . . .



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E. M. Johnson, Tuscaloosa, Alabama, has been dairying since 1936. He is a small dairyman, milking from fifteen to twenty cows regularly, but believes in doing a good job.

Even though Johnson's dairy is rather small, it is entirely electrified—and of all of the electrical equipment found on the farm, he probably enjoys his 5 hp electrically operated hammer mill as much as any. Formerly, the mill was operated by a tractor, but he noticed that his tractor just wouldn't last as long as it should when using it part time for grinding jobs. Too, it was inconvenient to bring it in out of the field to grind feed.

For six years now, the mill has worked like a charm. Feed can be ground at night, or just any time at his convenience and he can usually grind all the feed that he needs for his herd in less than an hour a week.

While the mill saves him money, the fact that it can be operated electrically has been worth far more than its original cost just for the convenience it affords him. Maintenance is negligible as Johnson keeps it clean and keeps the motor well covered. According to Johnson, it's just another one of those pieces of equipment that a dairyman can hardly afford to be without.

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Whatever else they may have accomplished, LIPSTICKS have made KISSING the MOST popular form of COLOR PRINTING . . . . Friend of ourn sez he SHORE would like to hear one of those TOBACCO auctioneers get in to an argument with his lil wifie . . . . SODDEN THOUGHT: Marriage is that period BEFORE which a gal has to KISS her man to HOLD him and AFTER which she has to HOLD him to KISS him . . . . Sez Caroline Clark, in Quote: "Some girls don't look for too much in a husband—just a man to spend with, the rest of their lives." . . . . LLAMA: an animal that LLOOKS LLIKE a camel . . . . OLD-SAW-NEW-TEETH DEPT.: Mary had a swarm of hees, And they, to save their lives, Went everywhere that Mary went—Because SHE had the HIVES . . . . Child psychologists are now in agreement. They suggest that all MUSICIANS' children be BOPTIZED . . . . PSYCHIATRIST'S COUCH: that's the place you land when you go off your rocker . . . . Then there was the poor little movie star who complained, "My first husband wants to marry me again, but I'm afraid he's after the money I married HIM for!" . . . . "And here," said the meek little man, as he showed the family album to a friend, "is a picture of my wife taken with a high speed camera." "How do you KNOW it was a high speed camera?" queried the friend. "Her mouth," replied the meek little man, "is closed." . . . . DRUNKARD'S ALIBI: "I didn't know I was loaded." . . . . SNICKERSNORT-OF-THE-MONTH: Hungry and exhausted, the hunter dropped his rifle, stumbled forward and threw his arms around the man who had just emerged from a clump of trees. "Thank heaven," he cried with relief. "Rescued at LAST! I've been LOST for TWO days." "Oh, NO!" cried the other. "I'VE been LOST for a WEEK!" . . . . PARTING THOUGHT: A LUCKY DOG is one who is always putting in the hardest LICKS

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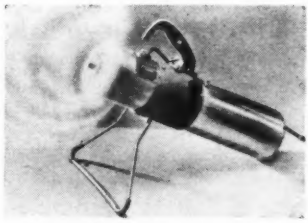
New and Useful Equipment

Electrical Units That May Be Helpful to You

Manufacturers are continuously improving upon their equipment and designing new equipment to make every job easier and quicker. Some of these products could be very useful to you for doing particular jobs.

• **Insecticide Fog Generator.** The hand portable "Microsol"

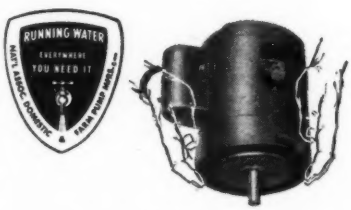


fog generator weighs only nine pounds. It has a built-in fan rotating at 19,000 rpm to convert insecticide into micron-size fog particles capable of filling a 64,000 cubic foot room in 15 minutes. Designed especially for fly control use in dairy barns and other large outdoor buildings. *(Silver Creek Precision Corp., Silver Creek, New York)*

• **Small Portable Milking Machine.** The "Cow-to-Can" milker is designed for the sole purpose of furnishing the small herd (2 to 15 cows) dairyman a milking machine within his financial reach. It is a ¾ hp unit which fits directly onto an ordinary 40-quart milk can. The milker utilizes a pneumatic pulsator together with stainless steel operating cover, sanitary claw and teat cup shells, a combination sanitary trap, vacuum controller,

and automatic type stall cock. *(The DeLaval Separator Company, Poughkeepsie, N. Y.)*

• **Seed Germinator.** This new germinator, made almost entirely of aluminum, is fitted with sen-



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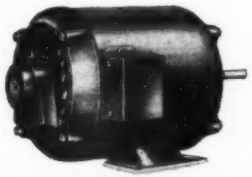

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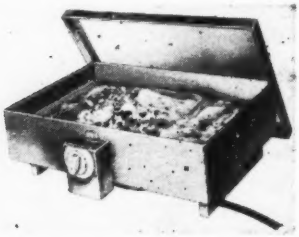
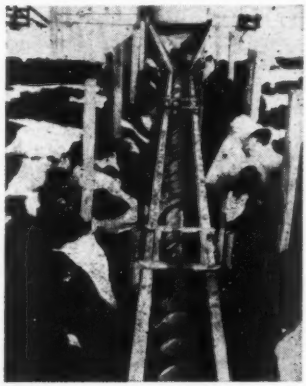
sitive heat controls and a moisture system to closely simulate



actual soil conditions and temperatures. Also serves as an ideal plant starter for gardeners and hobbyists. *(National Agricultural Supply Co., Fort Atkinson, Wisconsin.)*

• **Auger Type Bunk Feeder.** A sturdy 6 inch auger, powered by an electric motor with a direct belt drive, is used to push silage, chopped hay, or chopped green



pasture out to the livestock in the feed lot. Available for any width or length bunk, new or old, straightaway, "T" or "L" shaped, the unit has ample capacity to distribute material the entire length of the bunk with minimum power requirements. Furnished complete except for lumber and wiring. *(Van Dale Farm Machines, Inc., Wayzata, Minnesota and Clay Equipment Corp., Cedar Falls, Iowa.)*

• **Bayonet Saw.** A new bayonet saw, weighing only six pounds,

features an exclusive orbital motion for the blade in which the blade teeth are in contact only on the up or cutting stroke. The saw has a full 2 inch capacity in wood, ¾ inch in aluminum, and ¼ inch in steel. It also permits plunge cuts without drilling of starting holes. Unit is equipped with 3½ ampere motor, trigger switch, and an efficient blower to keep line of cut free from sawdust. *(Porter-Cable Machine Company, 66 Exchange Street, Syracuse, N. Y.)*

• **Automatic Nail Driver.** The "Nail-A-Matic" feeder will handle all nail sizes from 2 D through 16 D. Three hammer units are

available, one for 2 D to 5 D, one for 3 D to 8 D, and one for 6 D to 16 D nails. The unit is operated by compressed air from a 3 hp, 2 stage compressor. Nails are fed automatically from storage hopper. Speeds up to 50 nails per minute are possible, with 30 per minute being an average. One handed operation permits nailing at any angle. The hammer has a safety device to prevent propelling of nails from the nose unless hammer is depressed against material. *(Matrix Engineering Corporation, 3016 E. Lake St., Minneapolis 6, Minnesota.)*

• **Midget Incubator-Brooder Combination.** The "Midget Run" permits the small incubator to be used as a brooder as well. Chicks can leave incubator to exercise

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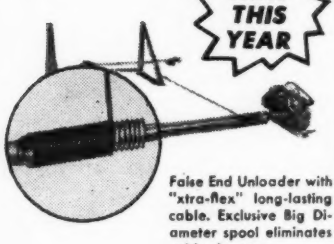

False End Unloader with "xtra-flex" long-lasting cable. Exclusive Big Diameter spool eliminates cable damage.

This is only one of the famous Flinchbaugh Unloaders. Canvas type and chain pull false ends also available.

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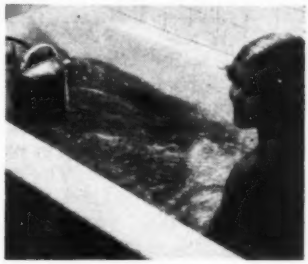
and feed in the "Midget Run" and return to the thermostatically controlled incubator for warmth.

Available in sizes to handle either 24 or 8 eggs. *(J. P. Glasby Manufacturing Co., Inc., 149 Montgomery St., Belleville 9, N. J.)*

• **Vinyl Jacketed Heating Cable.** This improved jacketed heating cable offers special features of durability, long life, and safety. The cable is constructed (from center to outside) of a nickel-chromium resistor heating wire, a nylon covering, a layer of vinyl insulation, a tinned-copper grounding braid, and an extruded vinyl jacket. Heat output is 5 watts per lineal foot and 26, 40, 60 and 100 ft lengths are available for operation on 115 volt

circuits. *(General Electric Co., Wiring Device Dept., Providence 7, R. I.)*

• **Hydromassage Pump.** This ⅓ hp, 115 volt pump is designed for use in the home bathtub to provide cascading, swirling water for massaging the human body. The action of heat plus



millions of tiny air bubbles, backed by the force of turbulent moving water, produces a massaging effect that relaxes persons in every age group—those without as well as those with muscular ailments. Entire unit, weighing 23 pounds, is complete with float switch, extension cord with built-in ground wire, and water filter. *(Jacuzzi Bros., Inc., 1440 San Pablo Avenue, Berkeley 2, California.)*

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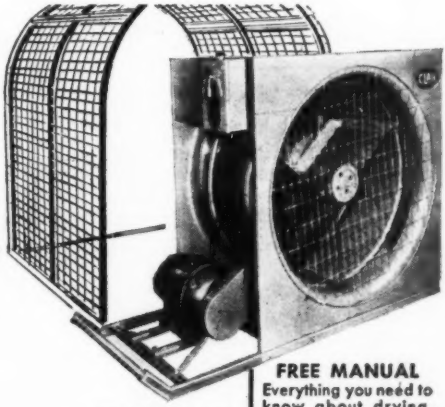

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All About Electric Motors—Part III

Selection and Application of Overload Protection and Controls for Electric Motors

By ROBERT H. BROWN

Quite often the success of a motor application depends upon the proper selection of a control for the motor. The control system for a farm electric motor should provide two things.

- It should protect the motor against overload.
- It should provide a means for starting and stopping motor.

Fuses for Overload Protection

The built-in overload device described earlier and a separate disconnect switch as shown in Figure 9 make up an inexpensive control system. The "plug-in" method is not recommended as a satisfactory control switch. Another control system, also inexpensive, is shown in Figure 10. The safety switch starts and stops the motor and the protection is furnished by a **time-delay fuse.** The time-delay fuse costs slightly more than a regular fuse but they are especially well adapted for motor protection.

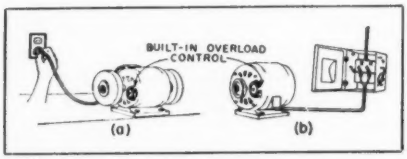

Fig. 9. Motors with built-in protection may be plugged into a convenience outlet (a), or connected to a disconnect switch (b).

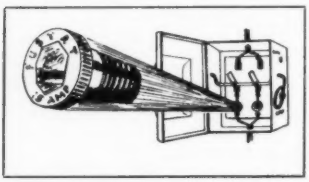

Fig. 10. This disconnect switch has a time-delay fuse for protecting the motor.

Several types are shown in Figure 11, and their operating principle is illustrated in Figure 12. When the flow of electricity to the motor is excessive the solder melts and releases the fuse link, thereby breaking the circuit. The fuse must be replaced after it performs its function. The time-delay fuses shown in Figures 10 and 11b are the tamperproof type. They can only be used in conjunction with special adapters and neither a regular fuse nor a larger time-delay fuse will fit into the adapter. Once the adapter is inserted into the plug-fuse holder, it cannot be removed without destroying it. **Selection of time-delay fuses for motor protection is made by multiplying the nameplate current of the motor (Amps) by 1.15.** A fuse having a rating of the resulting value or as close to the value as possible will furnish good protection for an electric motor, especially those sizes up to 2 hp. A complete control system including the switch, the time-delay fuse, and a pilot light is on the market, Figure 13. It is a compact unit mounted on a 4-11/16 inch square metallic outlet box and is available at reasonable cost.

Overload Protection Switches

The **manual starting switch** of Figure 14 provides both the on-off control and the overload protection. This type control is highly recommended for motors up to 2 hp. The control unit is sold minus the heater coil or strip and is adapted to the various motor sizes by changing heater coils or strips. Selection of the heater is made in one of three ways:

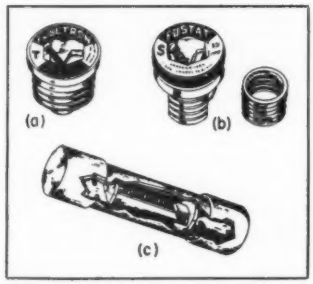

Fig. 11. Time-delay fuses are available in various styles. Type (a) will fit any regular plug fuse socket. Type (b) with the adapter is a tamperproof combination. Once the adapter is screwed into place in a fuse socket, it cannot be removed. Cartridge types as (c) available in sizes from 1/10 amp to 600 amps.

- Refer to the chart inside the cover plate of the control and choose a heater number which corresponds with the motor current (Amps) shown on the nameplate of the motor.

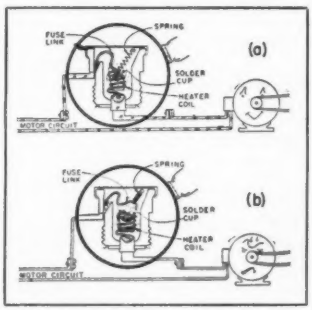

Fig. 12. Principle of operation of time-delay fuse. When excess load is applied, heater coil melts solder in solder cup and spring pulls fuse link from cup, thus opening circuit. On direct shorts, the fuse link melts.

• Refer to the control manufacturer's catalog and repeat the procedure outlined above.

• Multiply the motor nameplate current (Amps) by 1.15

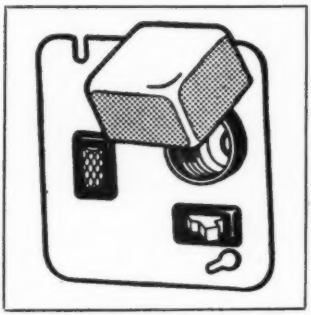

Fig. 13. This control for small motors provides switch, overcurrent protection, and a pilot light to indicate whether or not the motor is running.

and order a heater having this rating.

The principles of operation of manual starting switches are illustrated in Figure 15.

The excessive flow of electricity to the motor passes through the heater coil, causing the solder to melt and the ratchet to release the switch contacts.

These switches can be used over and over again, since after the mechanism is tripped it can be reset by operating the switch lever in the normal manner. To allow time for the heaters to cool it is usually necessary to wait about two minutes before restarting the motor.

Automatic Controls

In those instances where the operation of a small size motor is controlled by a time switch, a pressure switch, float switch or a thermostat, it is still recommended that one of the above type overload devices be used. The automatically operated switch starts and stops the motor but does not provide protection against overload. The manual starting switch is placed in the circuit and left in the "on" position. It does not inter-

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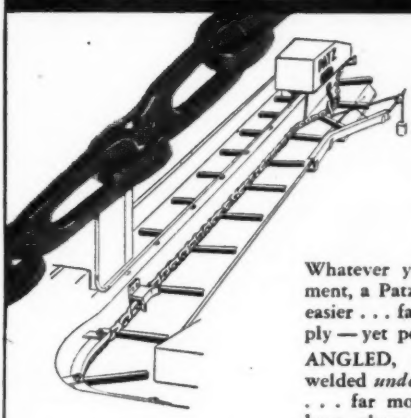

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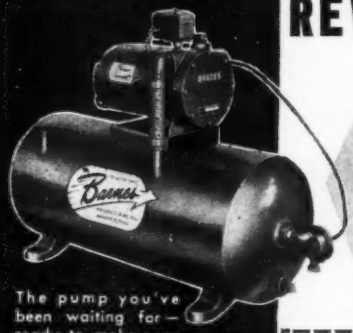

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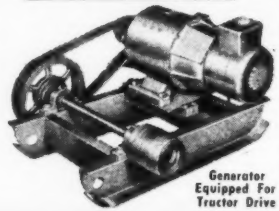

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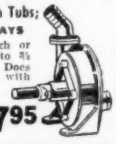

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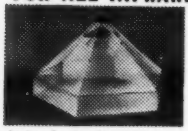

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fere with the automatic control but furnishes overload protection just the same.

Magnetic Starters

For motor hp sizes 2 and larger, a **magnetic starting switch** is recommended. This control could be used for the smaller motors but its initial cost is a limiting factor. A portable motor installation using a magnetic switch is illustrated in Figure 17. When the contacts of a magnetic switch are closed, electricity is supplied to the motor. But it is necessary to have a second control to cause the contacts of the magnetic switch to operate. This auxiliary switch may be a push-button, a toggle switch, or some type of automatic device such as a thermostat or pressure switch. The auxiliary switch turns on and off the flow of electricity to the coil of the magnetic switch. When electricity flows to the coil, the magnetic switch contacts are caused to close, and when no electricity flows to the coil, the contacts open. Once again a heater strip is employed to protect the motor. It is selected in a manner similar to that described for the manual starting switch.

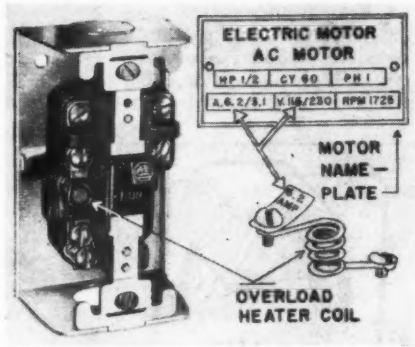


Fig. 14. Manually operated starting switch with a built-in overload device. Heater coil is selected according to size of motor.

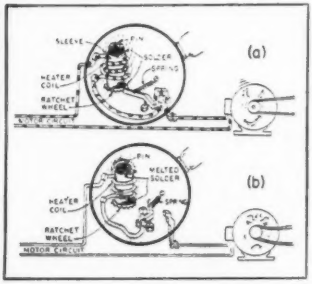


Fig. 15. Principle of operation of solder-and-ratchet type control as shown in Fig. 14. Overload heats coil and melts solder (b) allowing ratchet to turn and release switch. Control can be reset after cooling.

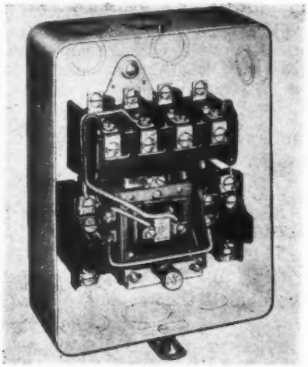


Fig. 16. Magnetic starting switch with heater coils to prevent overloading motor. An auxiliary switch is used with this unit.

Sketches used in this article are from the publication *"Selecting Farm Electric Motors, Controls, and Drives"* issued by the Southern Association of Agricultural Engineers and Vocational Agriculture, Barrow Hall, Athens, Georgia.

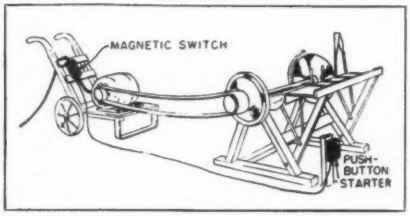


Fig. 17. Magnetic switch with a remotely located pushbutton starter. Motor is mounted for portable use.

THERE'S A WEALTH OF HELPFUL INFORMATION FOR YOU

in coming issues of

ELECTRICITY ON THE FARM *Magazine*

The magazine you hold in your hands has but one purpose: **to help you and your family get more comfort, efficiency and profits from electrically operated equipment and appliances!**

In this and coming issues, you'll find specific, continuing evidence of what we mean. For example,

MORE ON MOTORS...

The issue in your hands presents Part III in an important series on electric motors, "The Selection and Application of Overload Protection and Controls." January brought to you "Selecting an Electric Motor for Farm Application According to Type and Size." February brought you "Choosing an Electric Motor According to Special Physical Features." Still to come are chapters on "Installation" and "Maintenance." Written authoritatively by the University of Georgia's Professor Robert H. Brown (Agricultural Engineering Department), this is a series you'll be able to apply *in its entirety* to your electric motor problems!

MORE ON CROP DRYING...

Starting in April, you can look forward to plenty of help on crop drying: drying *your particular variety* of crops *faster* and maintaining *better quality*. In effect, it will be a blueprint for producing higher efficiency and profits next Summer!

MORE ON ELECTRIC RANGES...

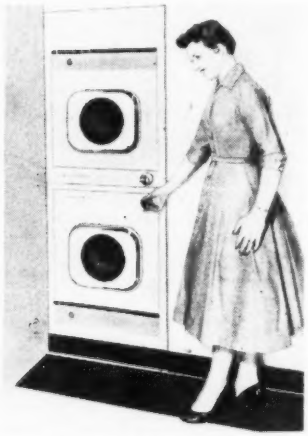
Know why more and more people are "making the switch to electric cooking"? Our editors do, and in this issue (and every issue throughout 1956) they'll be telling you about it. Here's excellent material for the Missus who is considering the electric range, and the Missus who already has one!

All this is typical of ELECTRICITY ON THE FARM's *specialized* editorial service. It's prepared only with the electrified farm in mind. It covers every phase of your operation involving electricity. It's designed to help you and your family *get more of everything good* from your equipment and appliances!

New Laundry Equipment Shopping

Combination Washer-Dryer vs. Separate Units

Which shall I buy—a combination washer-dryer or separate units? This problem confronts prospective purchasers of laundry equipment today. Several important factors



Completely automatic washing and drying in just 25 inches of space will be available in a few months. This new pair is designed so that the dryer may be installed above the washer.

should be considered in reaching this decision.

Perhaps first and foremost is the matter of space available for laundry equipment. In most cases the combination unit will require less floor space than two units and possibly the use of the single unit would permit its installation in kitchen or bathroom where separate units could not be accommodated.

Preference as to the type washer—agitator or tumble action—will help in this decision, since the combination washer-dryer uses tumble action only. Either the tumble action or agitator washer will do an efficient laundering job if manufacturer's instructions are followed.

Another point to be considered is personal laundry methods. The combination requires more time to complete the cycle of both washing and drying. However, all combinations may be operated individually as either a washer or a dryer. With separate pieces of equipment, one load of clothes may be washed while another is being dried. The combination will do only one load at a time. The water requirements are about the same for either type of unit.

Wiring also comes into consideration. The separate units require two circuits: a 115 volt for the washer and a 230 volt for the dryer. Only one circuit, a

. . . . . (More on page 26)

December's Range Contest Winners

Your response to our contest, "Why I Switched to Electric Cooking" was most gratifying. We received hundreds and hundreds of wonderful letters.

Although you may not be the winner, we would like to thank you for your entry. Every letter we received was inspiring and further evidence of the joy that a "switch" to electric cooking brings.

The twenty five dollar prize-winning letter, as selected by our judges, was written by Mrs. J. M. Frink of DeSoto, Kansas. Her entire letter appears on the opposite page. Portions of many other letters will be published in future issues. Their reasons for switching to electricity should be of great interest to you.

FIRST PLACE

Mrs. J. M. Frink
DeSoto, Kansas

HONORABLE MENTION

Mrs. Uno E. Kemppainen
Elo, Michigan

Mrs. Oliver Endsley
West Branch, Iowa

Mrs. Clyde W. Banks
Mauston, Wisconsin

Mrs. Zula Hall
Crawford, Nebraska

Mrs. Wheeler J. Welday
Smithfield, Ohio

Mrs. Frieda M. Lease
Madison, Wisconsin

Mrs. Lottie Zimmer
Plessis, New York

De Soto Kansas
Dec 20 1955.

This is "Why I Switched to Electric Cooking" I have been cooking in my own home for forty four years and have used

. . . every kind of fuel known.

I have dipped corn cobs into kerosene and used them to start a fire in a big kitchen range. Sometimes it was a wood fire, sometimes it was coal.

I have used kerosene for fuel, filling the tank on the stove from a five-gallon can I had bought from the nearest store. Sometimes the tank ran dry before the loaves of bread or the angel food cakes were finished baking and a smoky odor warned me to hurry and refill. It was a sad cake if the five-gallon can ran dry and a hurried trip had to be made to the store. The wicks of the kerosene stove were always needing cleaning and trimming and a too high flame blackened the cooking utensils.

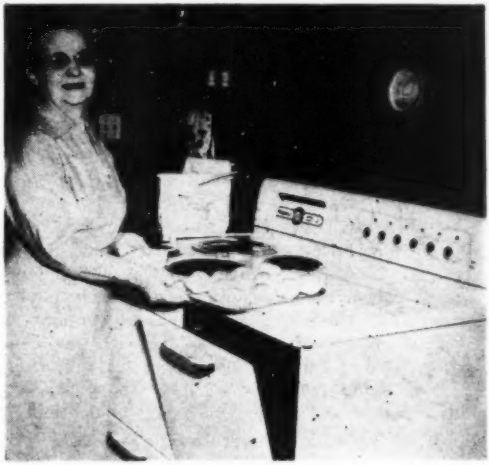
I have used gasoline for cooking fuel and then I thought I had found the very best. But that, too, meant refilling of the tank, cleaning burners and extreme caution for safety.

I next used gas, both natural and artificial, and that was an improvement. No filling the tank, no wicks to trim; but I did have to regularly boil clogged burners and I did have to watch that the flame was low and blue or my pans were blackened and always the walls of the kitchen held a greasy scum that was hard to remove.

Then we moved to a farm where there was no gas within miles. Our only choice of fuel was bottled gas or electricity. Then came bottled gas cooking. I still cleaned burners, scoured blackened pans and washed kitchen walls. There were the unsightly tanks. We mowed the grass around them and pulled the weeds the mower wouldn't reach. Rain, snow or mud, a truck backed into our yard to replace or refill the tanks. Our neighbors had accidents, explosions and fires. We changed to electricity and an electric range. That was the luckiest day of my entire life. That was ten years ago and each year, yes each month, I am more and more convinced that electric cooking is ideal.

It is the cheapest. Our fuel bills are much less than ever before. It is cleanest. Pots and pans are never smudged and my kitchen walls stay as clean as the other rooms of my home. The burners keep themselves clean. My stove is washed and wiped with the same white cloths that wipe my china and crystal.

It is safest, even for a child. Once the controls are set there is no variance.



It is best for the health of my family. Less water is needed for cooking and that means less vitamins poured down the drain. It gives the most leisure. Automatic timing controls allow for more recreation and rest and more time with my family.

It is most convenient. A push of the button or the turn of the switch brings instantaneous heat. It is the fuel most often available. Electricity reaches every locality. It is most dependable. The electric office never displays a card informing its customers it will be closed during the month of August. It is open six days a week, every week of the year and even on Sunday or at midnight my phone is as far as I have to go to get any assistance I might need.

I have lived through an era of great progress and have rejoiced with each advancement. We are living in a marvelous age. But—take away anything else you might . . . . . .

have to, yes, all else if you must — but — leave me the miracle of electric cooking.

Very truly yours.
Mrs. J. M. Frink

Low Cost Decorative Lighting

New Light Bulbs Create Atmosphere of Charm and Beauty

Many of you, I am sure, can remember back to the days of the Edison Lamp Bulb. These bulbs, of course, were an outstanding contribution to the progress of our civilization. Yet, as with any new product, they were far from perfect. The clear glass used for the bulb did nothing to diffuse the bright light emitted from the filament. If one looked directly at the glowing bulb, it had the same effect as staring into the sun. The "hot spot" in the bulb literally made you see spots before your eyes.

Thirty years ago, in 1926, a frosted bulb was developed which was a decided improvement. This bulb reduced the glare a great deal and made a more pleasing light for all uses.

Now lighting engineers have developed a new type of bulb, a new theory in lighting. Most of the important manufacturers are producing these new bulbs. They go by various trade names, but all are characterized by a soft pink color.

These pink bulbs have a special ceramic or silica coating, that scatters the light and eliminates the "hot spot" of the conventional inside frosted, incandescent lamp. Since the coating is either sealed inside the bulb or fused to the outside, there is no danger of the color being scratched or chipped off.

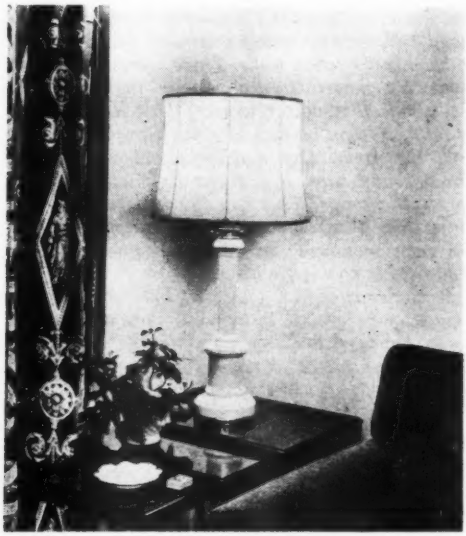
The new lamps were designed to create an atmosphere of beauty and charm. Their glareless pink light does away with sharp shadows and enhances the natural richness of home furnishings such as, cabinet work, woodwork, fabrics and various color schemes.

The light produced by these new incandescent bulbs, however, is more flattering to some colors than to others. Warm colors, the reds, oranges, and yellow-oranges, are enhanced and enlivened. These colors in home furnishings and clothes take on a new, fresh look, as do people's complexions. In fact, the pink light from the bulbs is so flattering to the complexion, that in most cases it is not recommended to use them while applying make-up. The cool colors, green, blue, blue-gray, and gray-greens, become subdued and grayed. To some people this effect on the cool colors is not unattractive.

Because of the special coating on these new bulbs, a little of the light quantity is lost. It is therefore advisable to use the next largest size in order to maintain adequate lighting levels for visual tasks.

New soft, pink bulbs are being manufactured in 60, 75, 100, and 150 watt sizes.

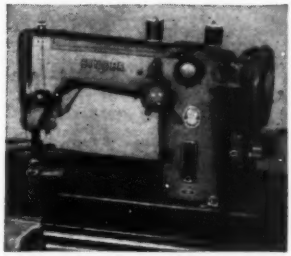
Before (unretouched photo): With a standard incandescent bulb, dark shadows form unattractive patterns on walls behind a lamp and distract the eye from the room's decor.



After (unretouched photo): With a new pink incandescent bulb the light is diffused over the walls. The texture of fabrics and wood grains are brought out.

McCall's Pattern 3491

Amazing new Swing-Needle **SINGER** Automatic brings out the "fashion designer" in you



NOW, even with the simplest pattern, you can do the detailed sewing of an expert seamstress—and create *original* finishing touches—all with the greatest of ease on the new Swing-Needle* SINGER Automatic!

This wonder machine, like all SINGERS, does *the smoothest straight stitching in this wide world—PLUS hundreds of practical, beautiful finishing stitches—completely automatically!* You'll take pride and pleasure in watching the Automatic blind-stitch hems, overcast seams. You'll discover there's no end to decorative stitches you can create to give *personal* touches to your clothes—the children's clothes—your home furnishings!

The Swing-Needle Automatic is the *newest* of the many SINGER* Sewing Machines, including both the Straight-Needle and Slant-Needle* models.

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There's one near you to serve you

Listed in your phone book only under Singer Sewing Machine Co.

*A Trade-Mark of THE SINGER MANUFACTURING COMPANY.

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A DIAMOND Iron Removal Filter takes out iron rust and other foreign matter and leaves water sparkling clear. Learn how little it costs.

Oshkosh Filter & Softener Co.
Oshkosh, Wisconsin

Laundry Equipment

. . . . . (Here from page 22)

230 volt, is required for the combination units. The slight additional cost of providing a 230 volt circuit to handle your dryer or combination is well worth the money when one considers the time, health and energy saved by using such a piece of equipment.

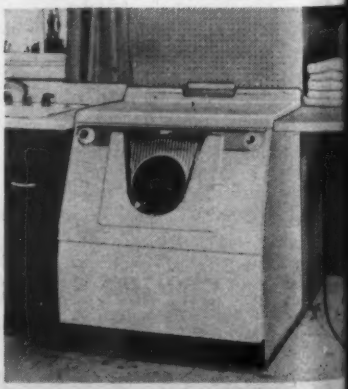
As is true with washers, all dryers will do a good job if manufacturer's recommendations of use are followed. The choice will be governed by preference for time and heat controls and method of moisture removal. Many dryers have an adjustable time control varying from one minute to three hours, depending on the brand of dryer. Some dryers shut off when a given temperature is reached. Oth are manually controlled.

The usual drying method i combination of heat, air blo by a fan, and tumbling. So dryers use varied heat setti and others have only one te perature and strong blowing air. Moisture is removed in o of three ways: venting to o doors; moisture condens units which may be connect to a drain or manually remov and rinsing of moisture and l down the drain. The latter r quires a plumbing outlet. B cause combination units ha drain connections for washi most of them use the l method of moisture and lint r moval. It is necessary to provi for some method of removi the excess moisture as mu steam is given off during t drying process. If th goes directly into th room there is likely be water condensati on walls and windo

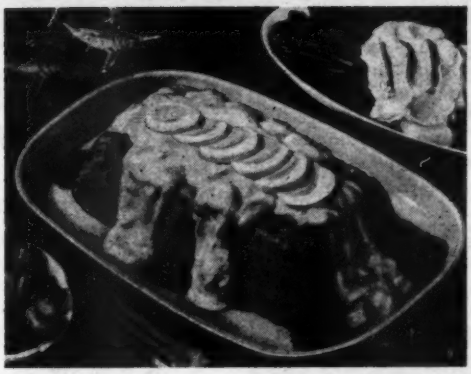
Lastly, the deal should be considered. is important to sele equipment from a loc dealer who offers a fu guarantee and reliab servicing.

The automatic lau dry equipment you s lect, whether a comb nation or separate uni will pay for itself ma times over by saving th homemaker's preciou time and energy.

Above: Separate units allow one load of clothes to be washed, while another is being dryed.



Right: Combination washer-dryer units do the job of two appliances in just a little more space than one of them would occupy.



Hearty March Meals

New Twist for Old Favorites
Sure to Please

Here's a new salmon loaf that is sure to become a favorite. Serve it often, it's so delicious, so nutritious, so easily prepared. The distinctive flavor and fluffy texture of this Farina Salmon Loaf topped with creamed mushrooms and hard cooked eggs will rate high with your family. The excellent texture and airiness of this loaf is obtained by using hot, cooked farina cereal as a base.

Salmon Farina Loaf

1 (16 ounce) can salmon
½ cup farina
3 cups milk
2 tablespoons butter
2 teaspoons salt
¼ teaspoon pepper
3 eggs, beaten
1½ tablespoons chopped onion
1 tablespoon lemon juice

1. Remove bones and skin from salmon. Break drained salmon into small pieces.
2. Bring milk to boiling point.
3. Add farina gradually, stirring constantly during addition.
4. Cook over low heat until thickened (2-3 minutes), stirring continually. Remove from heat.
5. Blend in salmon, butter, salt, pepper, eggs, onions, and lemon juice.
6. Pour into well greased loaf pan (9x5x3 inches).
7. Bake in a moderate oven (375° F.) about 40 minutes until done.

Yield: 6 generous servings.

No sauce is needed for this fine Farina Salmon Loaf because it is so delightfully moist. However, a Creamed Mushroom and Hard Cooked Egg Sauce adds glamour and extra good eating.

Saint Patrick's Day Dinner

A new twist for the traditional "boiled dinner" for Saint Patrick's Day, is ever-popular franks with fresh cabbage. This easy-to-prepare combination has plenty of old fashioned flavor appeal and is guaranteed to satisfy those man-sized appetites.

To make this St. Pat's Dinner a success, select meaty, branded franks. When marketing, allow one or two franks per serving. A one pound package will contain from eight to ten franks. Keep the meat refrigerated either in the original wrapper or wrapped loosely in waxed paper. The flavor is best when the prod-

ONLY Monarch HAS Since 1896 THIS SURFACE OVEN

PLUS A KING SIZE OVEN

Save STOOPING . . . Save MONEY with MONARCH'S Exclusive Surface Oven built flush into cooking top. Disappears like magic when not in use . . . Cover slides over to provide regular range top work area. Perfect for baking pies, cookies, cakes, etc. — roasting meats — casseroles — and as a warming oven. Range also features "Color-Vu" cooking switches, "Red Hot'n Seconds" surface unit, and king-size regular oven. See your MONARCH dealer or write . . .

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Please send Bulletin 901 on Strataflo Non-Freezing ☐ Yard Hydrants ☐ Wall Hydrants.
NAME
CITY
COUNTY STATE
SAVE TIME AND LABOR

uct is fresh, so try to use within three or four days of purchase.

On the day you prepare this attractive Frank and Cabbage supper, prepare two or three extra slices of bacon at breakfast. Keep the bacon in the refrigerator until time to prepare the evening meal.

To prepare the cabbage, cut almost through a medium sized head of young, tender cabbage to form eight wedges. Cook in an uncovered kettle or saucepan containing boiling salted water to cover. Cook until tender. This will take from seven to fifteen minutes, depending upon the age of the cabbage. While the vegetable is cooking, simmer (do not boil) the franks in water for about five to eight minutes. Use kitchen tongs to remove the franks when ready to serve. Do not pierce the franks with a fork

Saint Patrick's Day Dinner

lest the flavorful juices escape.

Serve the whole cabbage, seasoned with butter and salt and sprinkled with crumbled bacon for extra flavor, on a large, heated platter with the hot franks. Boiled potatoes with parsley butter are a "must" with this dinner. A fruit or vegetable salad, dessert and a beverage complete the menu.

Helpful Hints

Ironing flannel shirts on the wrong side keeps them much nicer and fluffier on the outside.

As you know, fresh pork can be stored in the freezer for three to six months. Cured and smoked pork can also be frozen, if you like. But because of its higher salt content, its stay in the freezer should be shorter—a month or two, at most.

To avoid a home-made look, press as you sew. An iron skillfully used is as necessary to smart dressmaking as a sewing machine. The seam is no longer considered complete when it is stitched the recommended number of stitches per inch or is the same width seam allowance throughout. Stitching and pressing go hand in hand.

PASTEURIZE RAW MILK

- IN THE CITY IT'S A LAW
- ON THE FARM IT'S A MUST

Only through pasteurization can you positively protect your family from diseases spread through raw, unpasteurized milk—such as undulant fever, typhoid fever, strep sore throat and polio. Just testing cows won't do it. City residents are protected by laws requiring dairies to pasteurize milk. You can give your family this same advantage in your own home.

HOME HEALTH HOME PASTEURIZERS

MAKE MILK SAFE TO DRINK

EASILY, QUICKLY, AUTOMATICALLY

FOR LARGER FAMILIES. A two gallon pasteurizer that's compact and light-weight. Positive bacteria kill without loss of flavor. Dual heat principle. Just turn it on . . . it's automatic. Priced at 36.50

FOR SMALLER FAMILIES. Popular one gallon size gives same positive pasteurization. Accurate timer-thermostat. No watching or stirring. Convection Heat Principle. Both models guaranteed for one year . . . Underwriters approved . 1 gal. size, 27.50

FREE FOLDER Get the facts on milk-borne diseases and their prevention through pasteurization. Write

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9267—Easy-sew ensemble for daughter. Full-circle skirt, jacket for cover-up. Child's Sizes 2,4,6,8,10. Size 6 dress and jacket, 2⅝ yards 35-inch fabric; ½ yard contrast.

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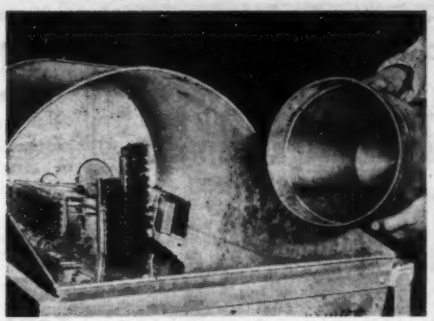
Send THIRTY-FIVE CENTS (in coins) for EACH pattern to: ELECTRICITY ON THE FARM, P.O. Box 42, Old Chelsea Station, New York 11, New York.
IN CANADA: 60 Front St. West Toronto 2, Ontario
Add FIVE CENTS for EACH pattern for 1st-class mailing. For SPRING-SUMMER FASHION BOOK, add TWENTY-FIVE CENTS.

Motorized Scrubbers Clean Maple Sap Buckets



Arthur Darrah's scrubber has four brushes on a rotary shaft. Brushes are adjustable to handle any size bucket. Tank holds supply of soapy water.

To many a farmer in northern states, March means sunshiny days and frosty nights—and that means maple sugaring season, first cash crop of the year and a dandy tonic after being cooped up all winter. But it also means a chore that's very much "a pain in the neck"—washing sap buckets after the run is over.

The simple electrified washer rigged up by Herbert D. Sprague, Brandon, Vt., pretty much solves this chore. It washes clean, it's inexpensive, and it's highly efficient. The unit cost him only $1.50 for five ordinary scrub brushes plus a used ½ hp electric motor.

Herbert Sprague's bucket washer is very simple. Bucket is dunked in hot water, then slipped over revolving brushes.

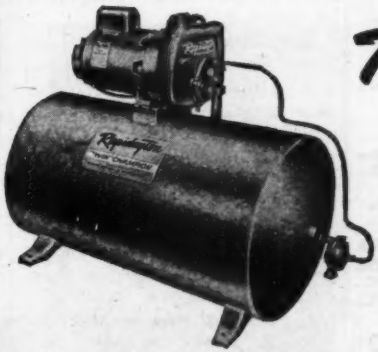
The brushes are fastened to a wooden block on the end of a ¾-inch shaft. One revolving brush scrubs the bottom, and the other four scour the sides. They're spaced to fit snugly into Sprague's 13-quart buckets. At the other end of the shaft is a 20" pulley run by a belt from the motor. The brushes are 7 inches by 8 inches in size.

A similar idea, but flexible enough to handle any size bucket, has been developed by Arthur Darrah, Rochester, Vt. Here, the business end of the motorized shaft consists of four brushes, so mounted as to "expand" and handle any bucket regardless of its size or flare. A foot lever applies the pressure that operates them.

Two large brushes, 2¾ inches by 10 inches, take care of the bucket sides. Mounted on rocker arms, they expand outward and also swivel at the center to fit the bucket's slant. The two smaller brushes at the end are 1½ inches by 7½ inches. They are expanded by a system of cables and springs to scrub the bottom and will handle buckets up to 21 inches in diameter.

Darrah slides his bucket over the brushes, pushes the foot lever to make them fit the bucket, holds it there a few seconds, and the job's done. A crew of three or four men, keeping the buckets moving, can wash up to 1,000 an hour.

FOR PLENTY OF WATER EVERYWHERE install a



Rapidayton TWIN CHAMPION WATER SYSTEM

Modern farms require **more water in more places—under adequate pressure.** You can rely on the power-packed Rapidayton TWIN Champion, the TWO-impeller package system shown here. It actually loafs along while pumping full capacity at 40 lbs. pressure (compared to a loss of 50% to 80% in one-impeller pumps). Completely automatic, rugged, **dependable.** Goes down to 150 feet. Has Quad-Volute design for maximum efficiency and exclusive Quick-Connect flange for quick, easy installation. See the Rapidayton TWIN at your dealer's. Write for free booklet, "What Kind of Water Pump Do You Need?"

Dayton Pump & Mfg. Co., Rural Sales Dept. 128, Dayton 1, Ohio

Does your water system lose its prime?

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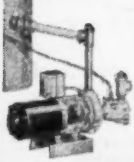
ARE SELF PRIMING

Burks *Super-Turbine* Pumps are fully automatic. They will not air-bind because they can pump water, air or a mixture of both to full usable water system pressures. This Burks self priming feature makes them easier to install, too, because there is no need for expensive deep ditches to the well.



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2. Lift farther.
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Farm Shop a "Must"

Young Farmer Utilizes Labor, Cuts Cost with On-the-Farm Repairing and Servicing

By **FRANK BAILEY**

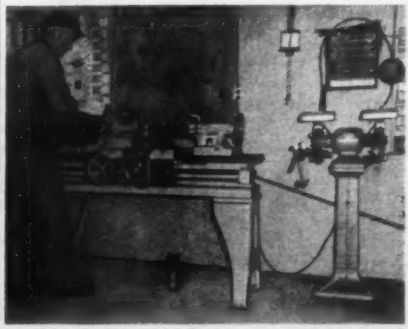
Otto H. Wallingford, whom I first met in 1947 while he was a student of Agricultural Engineering at the University of Maine, chose to return to the home farm on Perkins' Ridge, Auburn, Maine, after graduation. Wallingford entered the University in 1941 to major in Agricultural Engineering. In the spring of 1943, he enlisted in the United States Marine Corps and saw service in the South Pacific. Upon being discharged from the service, he completed his course in 1948.

The home farm known as "Wallingford Orchards" has, since Otto's return, undergone many major changes with electricity playing a major roll.

As much of the equipment for use on the farm is designed and the work done by their own laborers, a modern heated workshop was one of the first major projects. For this, the first floor of the old barn on the site of his grandparent's homestead was remodelled.

Equipment has been added, a little at the time, over the years as requirements arose and funds permitted. Otto now has a shop equipped with a 10 inch tilting table saw, a 6 inch jointer, a 14 inch lathe, a drill press, a 12 inch single surfacer, an 8 inch tool grinder, and a large power drill as far as stationary tools are concerned. Along with this, he has acquired a complete set of high quality hand tools, a radial and portable electric hand saw combination, portable drills, both electric and acetylene welders, and many other small tools.

In one corner of the workshop is a built-in wall cabinet with bins all properly marked for carriage bolts, machine bolts, pipe fittings, cap screws, washers and nails of all sizes. Having these miscellaneous items on hand has



Wallingford has a 14 inch lathe in his shop which enables him to perform a great number of tooling operations in the building and repairing of his farm equipment. Also, note tool grinder at right.

Wallingford feels that one of the first pieces of equipment any shop should have is a drill press together with a good assortment of high speed drills.

saved numerous expensive trips to town as well as time lost in hunting for just the right item.

Otto has designed and built in his workshop a large fertilizer spreader, many pieces of modern cider mill equipment, conveyor systems for apples, orchard trailers, and a mouse baiting machine, among other things.

To the Wallingfords, the completely equipped farm shop eliminates many trips to distant repair shops, cuts down time lost in labor while having machinery repaired, allows utilization of labor during slack periods, makes possible better service maintenance of machinery, and gives great enjoyment and satisfaction to Otto as a sort of hobby.

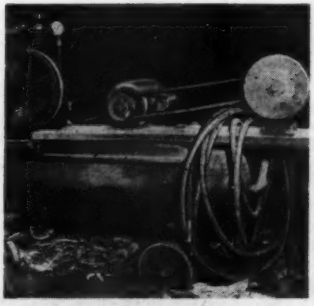
"What's the use of living in town, Mom? Every electrical appliance we've got Herbie has on his farm, plus a lot more."

March 3-11 National 4-H Club Week

During the week beginning March 3 more than 2,100,000 4-H Club members in the 48 States, Alaska, Hawaii, and Puerto Rico will participate in National 4-H Club week. Improving Family and Community Living is the continuing theme for the year. Six top-ranking members will spend the week in Washington, D. C., where they will give a Report to the Nation. The three boys and three girls named as typically outstanding this year are: Angela Heine, Ellendale, N. D.; Franklin McKay, Clayton, N. M.; Ann Guindon, Plankinton, S. D.; Eldon Rebhorn, Oswego, Ill.; Nellie McClure, Cleveland, Tenn.; and William C. Thiesenhusen, Muskego, Wis.

Double Duty Motor

There are many places where you can make your electric motors do double duty. Here's an example of how Alec Bell, Nokesville, Virginia, is making a half horsepower motor do two



jobs. By merely changing the belt, this motor runs either his air compressor or his emery wheel grinder.

Bell simply mounted the motor and grinder wheel on a 2x8-inch plank and bolted this unit to the compressor rig. By proper spacing, the belt can be shifted from compressor to grinder.

The 1955 honey crop in the U.S. was 243,100,000 pounds.

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Mechanized Silage Handling

Elevator and Gravity Type Bunk Feeds 100 Hereford Steers Daily

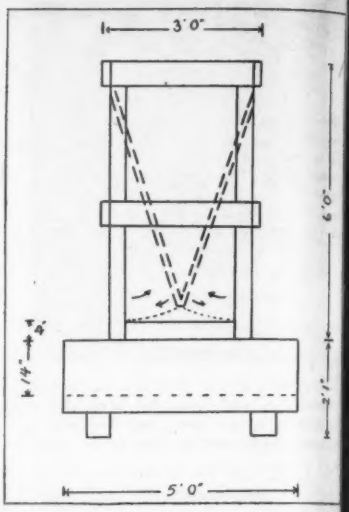
By L. W. McCONNELL

Last winter, a 1 hp. electric elevator did the work of carrying 90 tons of corn silage to 100 head of Hereford cattle on the farm of Glen Arehart, Churubusco, Indiana. The elevator was installed through a slit cut in the hay mow floor. Ensilage from the silo chute fell directly on the elevator and was carried above mow floor level, then dropped to the hopper of a self feeding bunk in the stable below.

Bunk Holds 24-Hour Feed Supply

His gravity type self-feeding silage bunk holds a 24 hr. supply of silage for 100 steers. Arehart's design does not clog and the only attention required is the usual clean-out of coarse silage stems rejected by the cattle.

The feeding bunk was built rectangular in shape, 5 ft. by 12 ft. and 14 inches deep. This rests on skids, making the top edge of the bunk 25 inches high. The storage hopper was framed up from the skids, one foot smaller on all sides than the bunk. The hopper, therefore, was also a rectangular box, 3 ft. by 10 ft. in size. This was built six feet high with all sides vertical and finished smooth on the inside.



End view of the feed bunk showing construction and dimensions. Sides are hinged to swing in when hopper is empty. Bunk is 12 ft. long and feeding area is provided along the entire perimeter, giving a total of 34 ft. of bunk space.

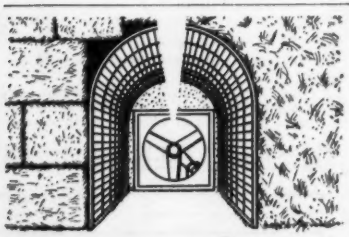
The 3 ft. by 6 ft. end sections were built up solid and the 1[illegible] ft. sides were hinged at the top to permit swinging in to the middle of the five foot wide bunk when it is empty. A band of 1 in. by 5 in. boards around the middle of the hopper prevents the sides from swinging outward when full. However they do bulge slightly, making the hopper somewhat larger at the bottom than at the top. This flexible construction with free swinging sides allows cattle to work the silage down as needed and also to reach the middle of the bunk to get the last bite.

It was decided that the hopper sides should terminate [illegible] inches above the floor of the bunk. With this amount of head room there is no danger of the animals being trapped by the hinged sides of the hopper.

The elevator carries silage from silo chute in rear to feed bunk at right. Feed bunk is located in loafing area.

Metal Elevator Withstood Acids

Arehart reported that some of the problems anticipated when he planned this self feeding system failed to materialize. The silage acids did not cause



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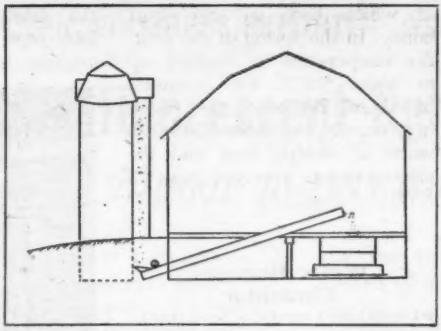

Overall sketch of the Arehart silage feeding set-up. A 1 hp electric motor powers the elevator to carry silage from silo chute up and over to the feed bunk.

cessive rusting of the steel elevator, and no trouble was experienced with silage "bridging" in the hopper. Because of space limitations in the stable, the bunk had to be built smaller than believed desirable for 100 head of 600 lb. steers. The perimeter of the bunk with dimensions mentioned above is 34 feet. This allows only about four inches of bunk space per steer. However, since the silage is available 24 hours a day, very little crowding occurs. During the feeding period each animal also receives four pounds of grain and two pounds of protein supplement from other feeder space in the loafing area of the barn.

Arehart estimates that his electric elevator saved him the trouble of walking 40 miles with a 50 lb. tub of ensilage—also walking back another 40 miles with the empty basket. Furthermore, he is not overlooking the fact that he avoided lifting the 90 tons of silage another time with a scoop shovel.

Space Heater for Farm Office

Carl Belke, manager of Golden Acres Farm, Newton, Penna. has his farm office right next to the cow stable. He has it fixed up nicely with an ample desk, good lighting and file cases. It is a handy place to keep accounts and records up to date. Also, he can look through the windows into the cow stable and see what is going on.

There was one reservation however. In the winter it was just too cold for comfort. Carl did not want it "living room" warm but he did want it so that he could write and do his book work. He found the answer with a radiant glass panel electric heater hung on the wall. It is thermostatically controlled and requires no fuel storage or chimney flues, making it entirely safe for use in the barn.

Carl says, "I had the office in the summer time. The electric heater gave me an office in the winter time."

Belke at the desk in his farm office. The thermostatically controlled space heater hung on the wall alongside desk keeps the office warm and comfortable during cold winter days.

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Questions and Answers

Beehive Heater

▶**Question:** *I have heard that there are electric beehive heaters available. Can you give me some information on them?*

J.F., Georgia

▶**Answer:** Electric beehive heaters are available on the market. They are thermostatically controlled heater sections which are inserted into the hive assembly to maintain the temperature of 57°F. This is the temperature at which bees eat the least honey. In the spring of the year, the temperature is stepped up to about 75°F. for optimum brood rearing conditions. Each hive usually uses from 75 to 100 watts of electric heat and the electric energy averages about 15 KWHr a season for each hive.

Water Hammer Eliminator

▶**Question:** *Our dairy barn drinking cups cause a "back lash" banging in our water pipes whenever a cow takes a drink. How can we eliminate this very annoying situation?*

Mrs. R.M.P., Indiana

▶**Answer:** Here is how a Michigan farmer eliminated water hammer caused by the drinking cups in his barn: First, he took a piece of 2 inch pipe, about 2 feet in length, and fitted it with reducer fittings to bring it down to the size of the ¾ inch water line on one end and capped the other end. Then he used a piece of bicycle inner tube about 12 inches in length in this 2 inch pipe to maintain a cushion of air. The inner tube was vulcanized shut at one end and a tire valve stem was vulcanized onto the other end. After inserting the inner tube in the pipe, it was pumped up to a pressure three to five pounds less than that of the water system.

The water line is uncoupled and a tee is inserted in place of a regular 90° ell fitting any place between the pressure tank and the drinking fountain. The 2 inch pipe, with the inner tube cushion, is screwed into the tee.

The bicycle inner tube at left is closed at one end and has a valve stem at the other.

It does not have to be set upright.

This Michigan farmer has used his "water hammer eliminator" for three years now with no maintenance attention being needed and no more annoyance from banging water pipes.

Home Milk Pasteurizers

▶**Question:** *What sizes are available for home milk pasteurizers?*

W.J.K., Ohio

▶**Answer:** Home milk pasteurizers are available in sizes from 1 to 2 gallons. The temperature in these units is controlled automatically. The usual procedure is to place the milk in a pail or in bottles, then the electric heater brings the milk up to 143° F. and holds it there for 30 minutes. A bell or buzzer notifies the operator when the milk has been pasteurized. Pasteurization destroys the germs causing undulant fever as well as other milk-bone disease germs such as typhoid fever, scarlet fever, strep sore throat, food poisoning, and diphtheria.

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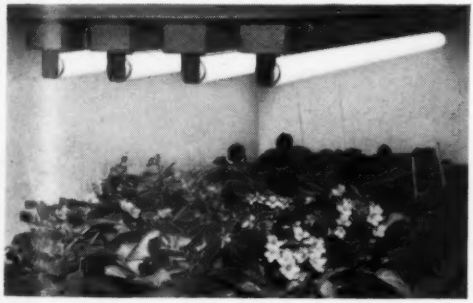

This home grower uses standard cool white and daylight fluorescent lamp channels suspended over African violets.

Many types of plant growth cabinets are also available. They use 2 to 8 standard cool white or daylight fluorescent lamps.

A suspension of fixtures over simple wooden benches provides plant lighting for a larger basement flower room.

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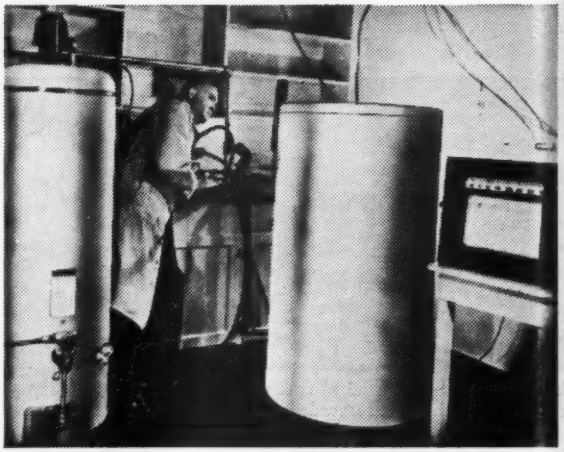

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